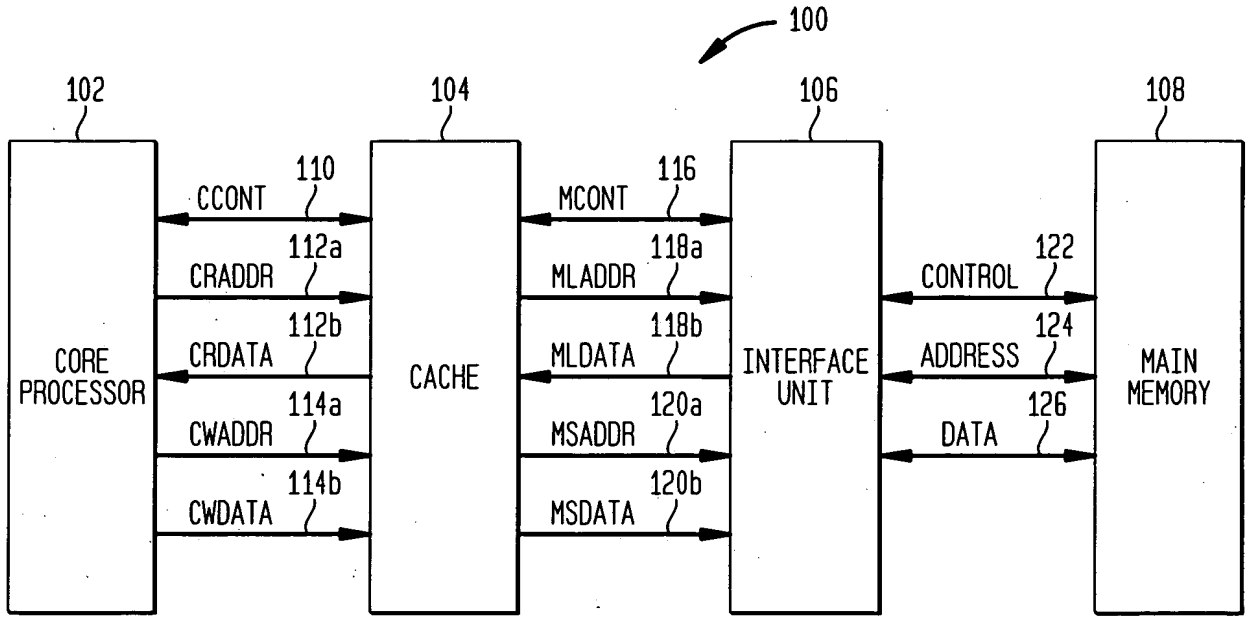
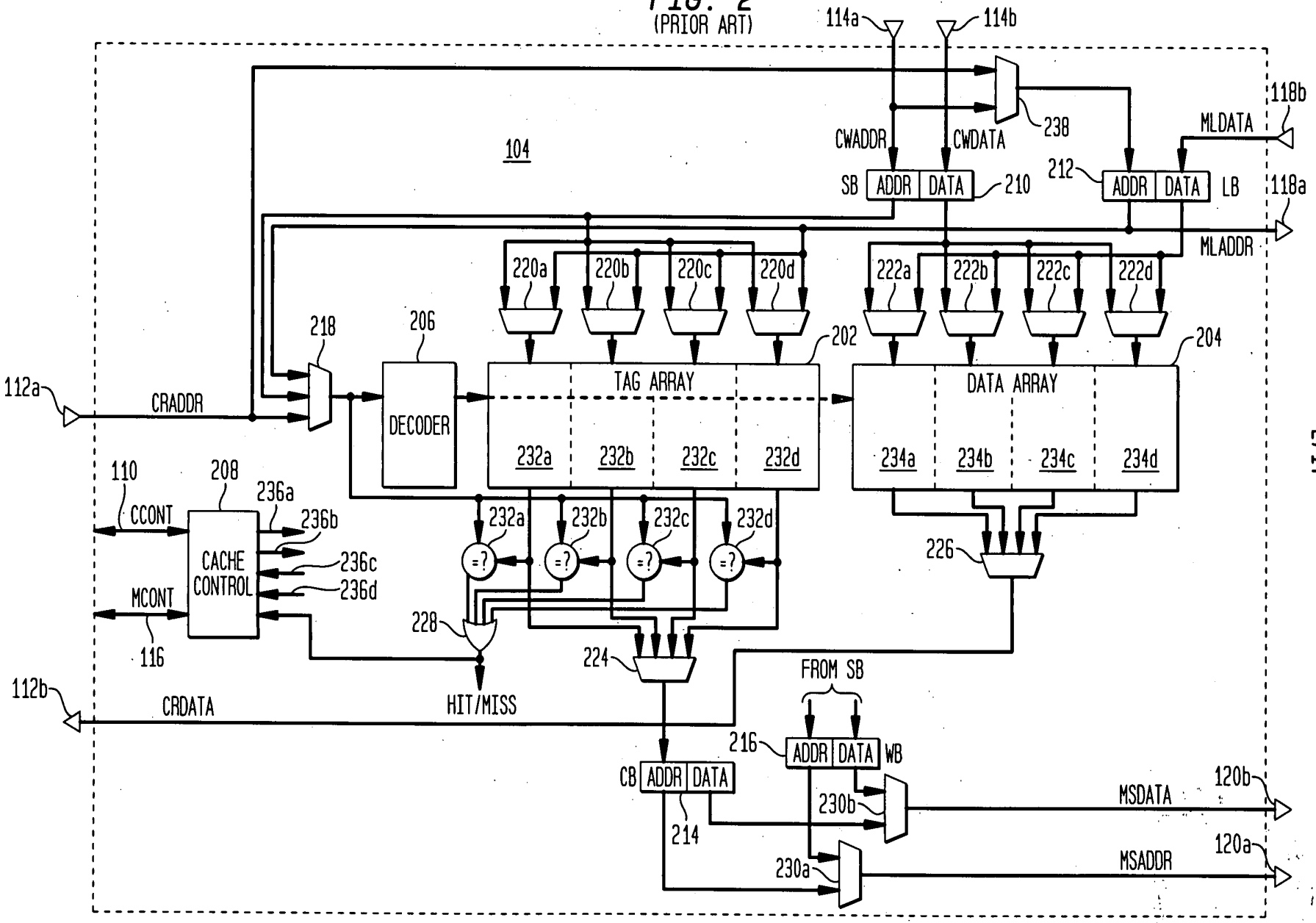
09/760,209 01/16/01

FIG. 1
(PRIOR ART)



TOTTSO"60267260

FIG. 2
(PRIOR ART)



EP 1 564 650 A2

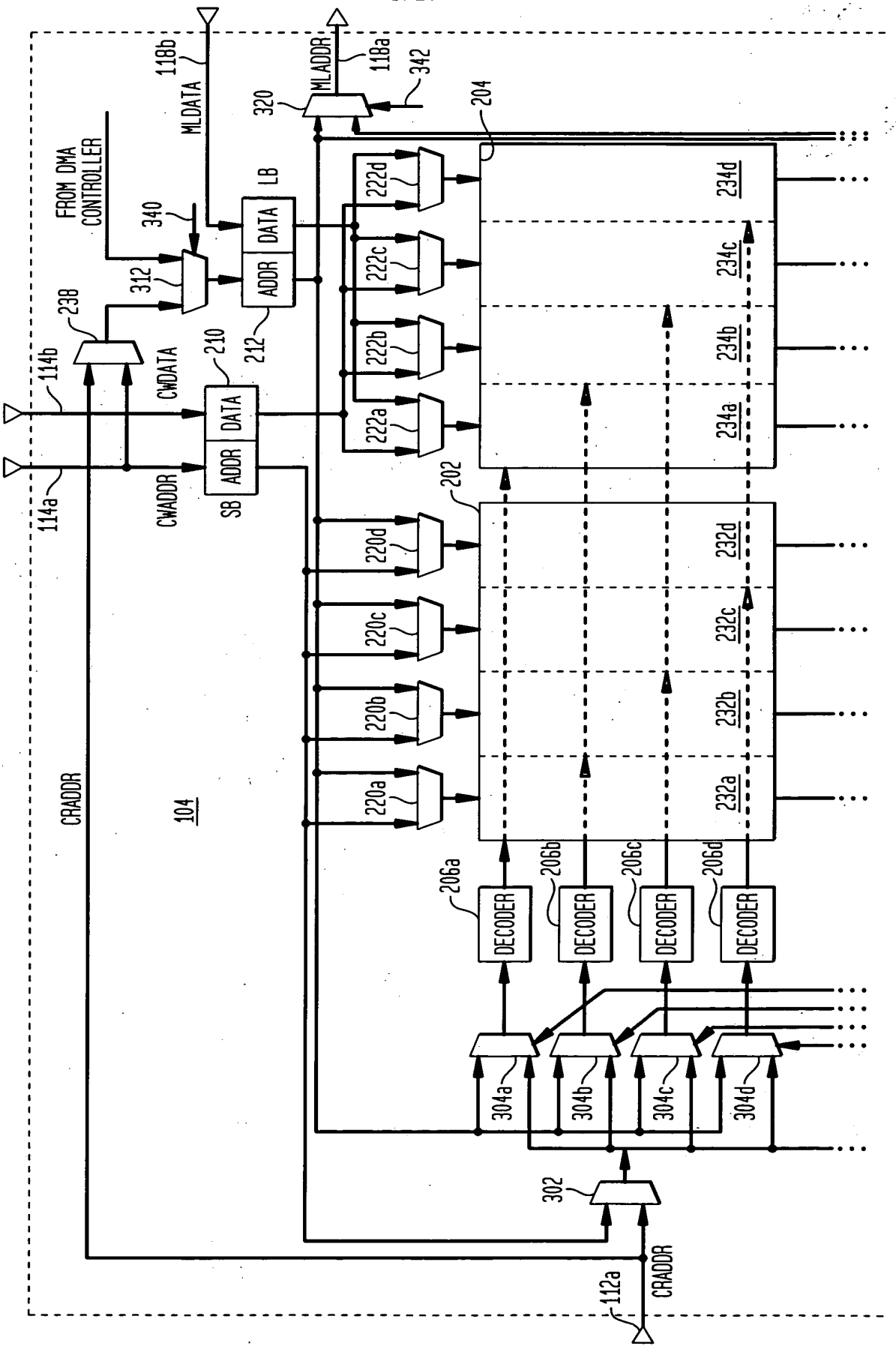


FIG. 3A

TOTSO"60267260

FIG. 3B

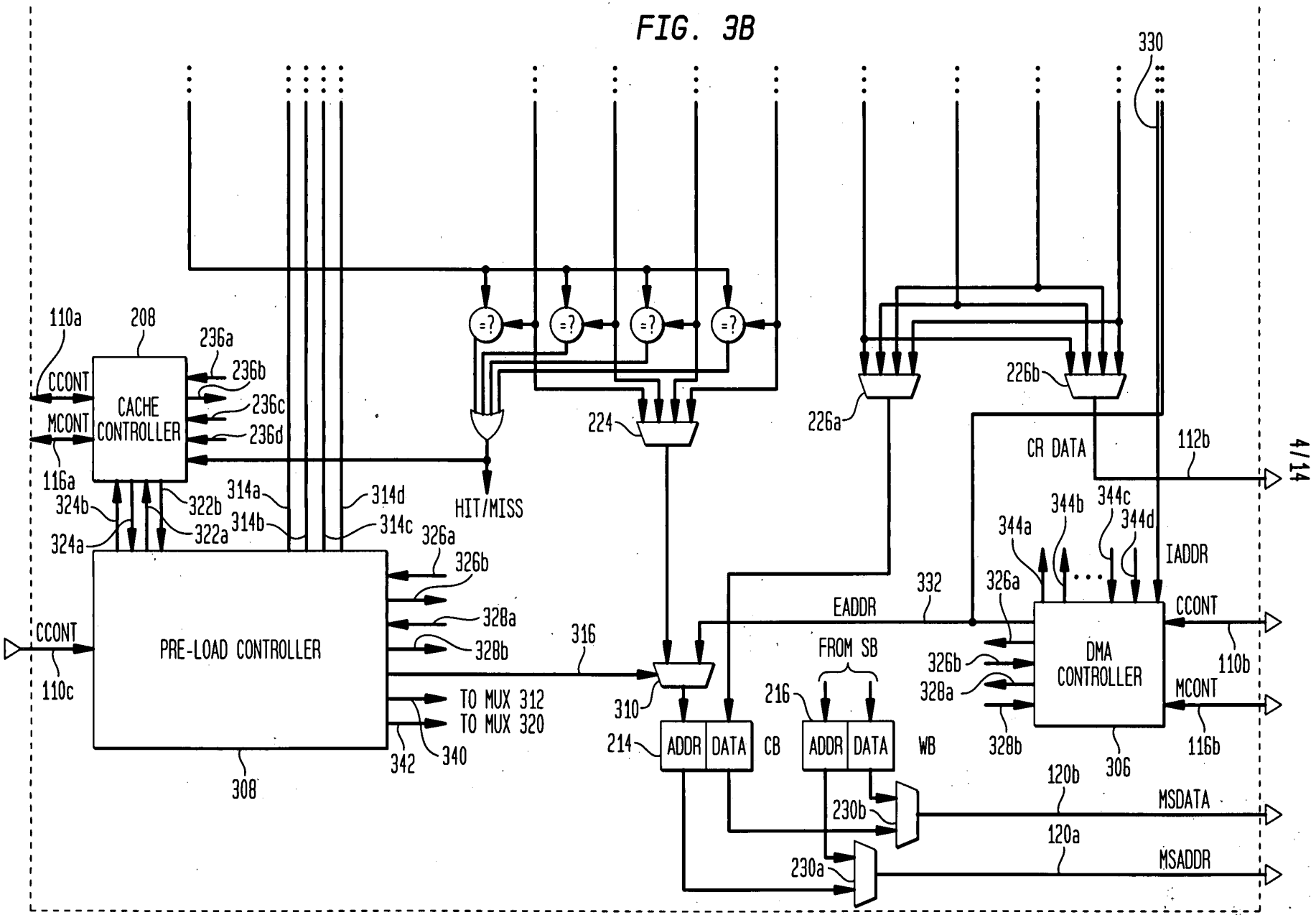


FIG. 4

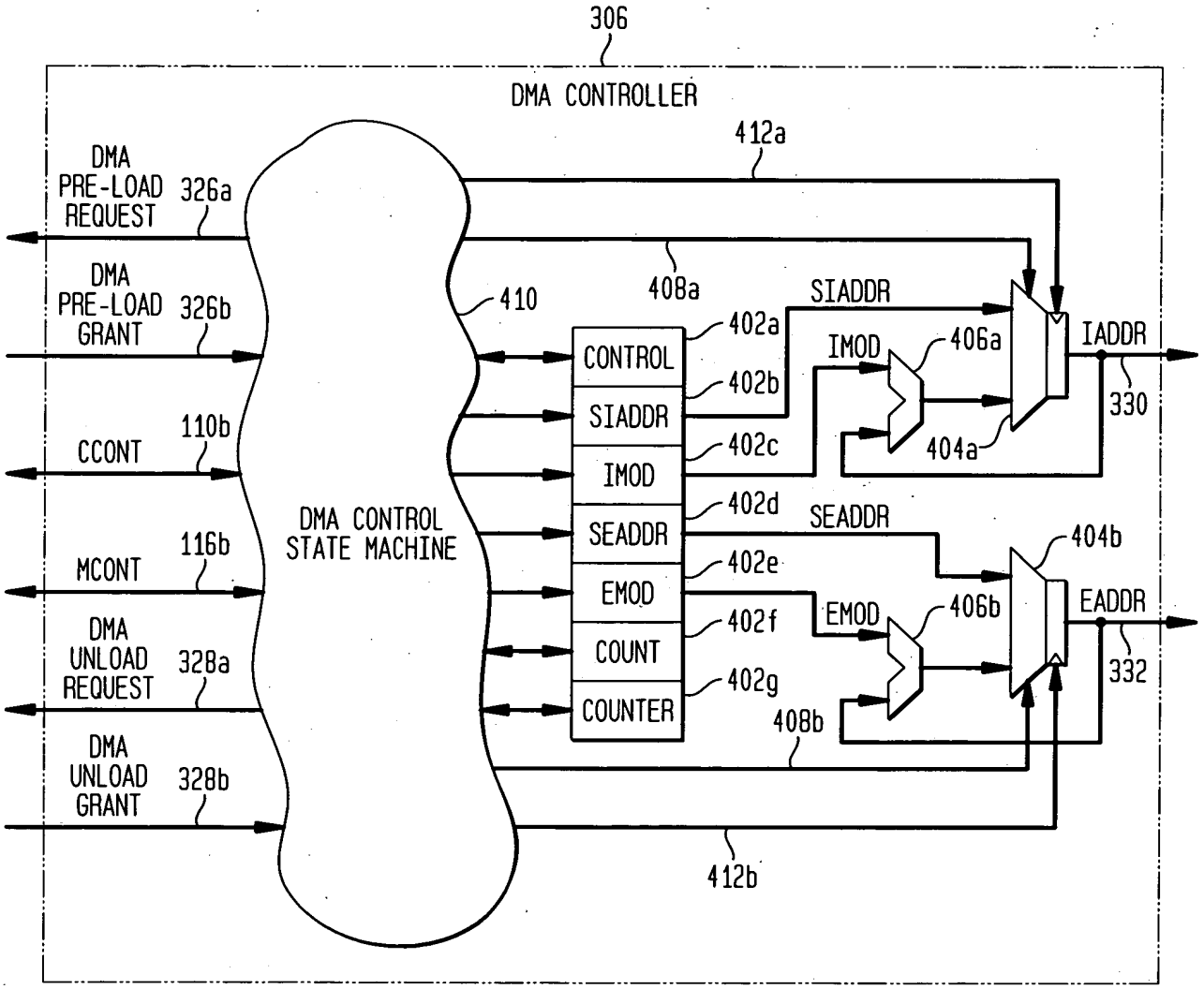
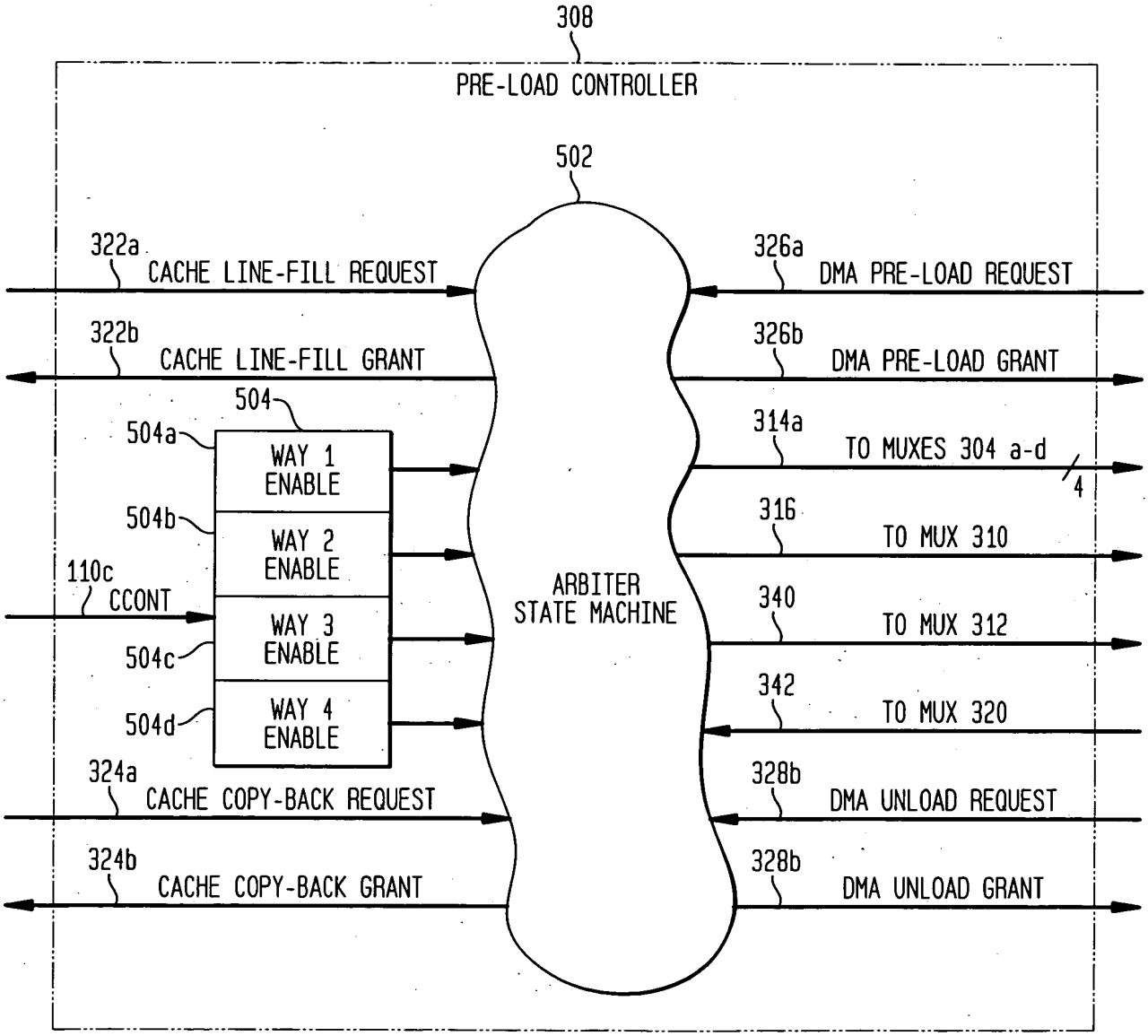
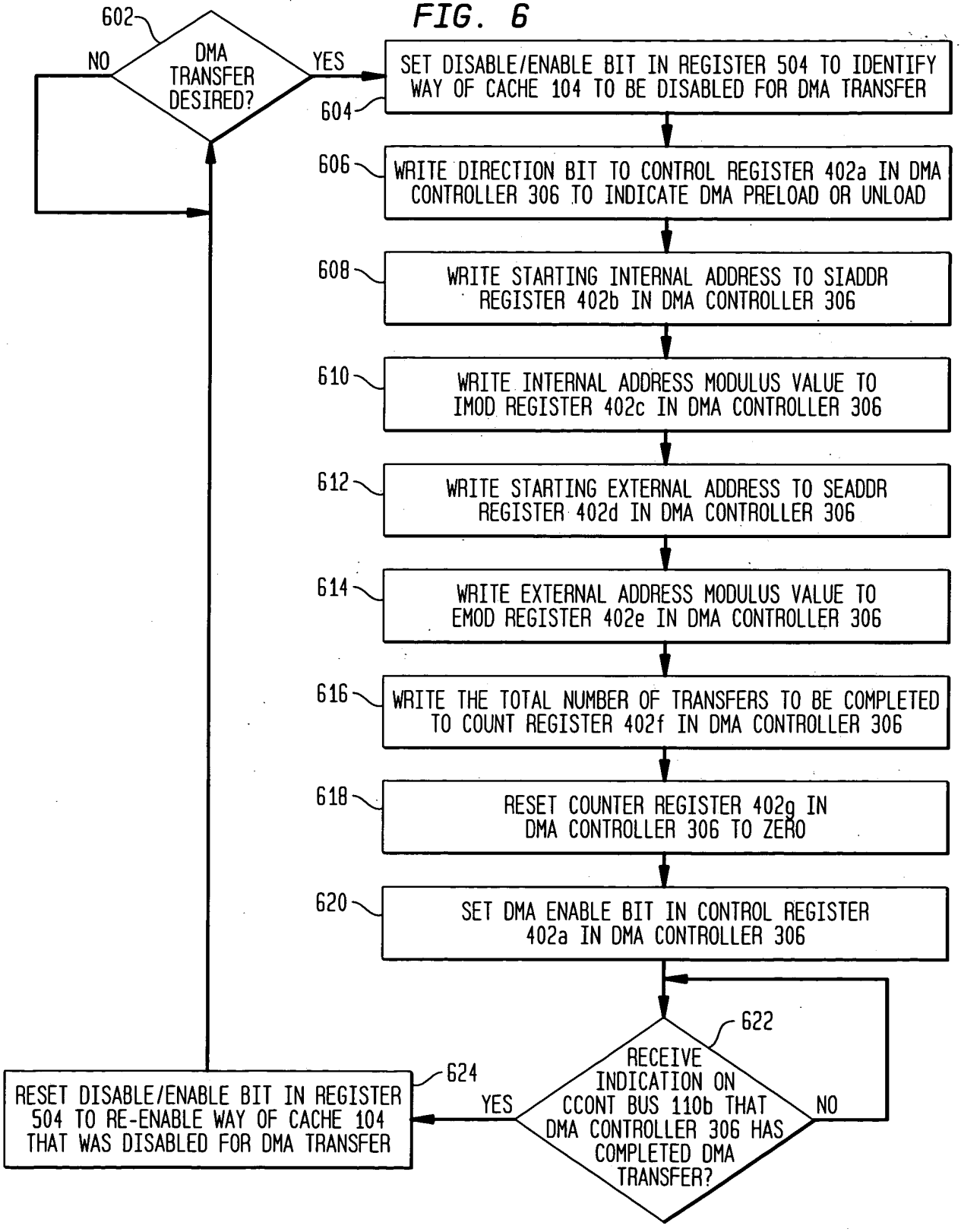

306
DMA CONTROLLER
412a
DMA PRE-LOAD REQUEST
326a
DMA PRE-LOAD GRANT
326b
CCONT
110b
MCONT
116b
DMA UNLOAD REQUEST
328a
DMA UNLOAD GRANT
328b
DMA CONTROL STATE MACHINE
410
408a
CONTROL
SIADDR
IMOD
SEADDR
EMOD
COUNT
COUNTER
402a
402b
402c
402d
402e
402f
402g
SIADDR
IMOD
406a
404a
IADDR
330
SEADDR
404b
EMOD
406b
EADDR
332
408b
412b

FIG. 5



09/29/2005 15:41:05 PAGE 006/014

FIG. 6



Docket: 5678.US.P1

FIG. 7A

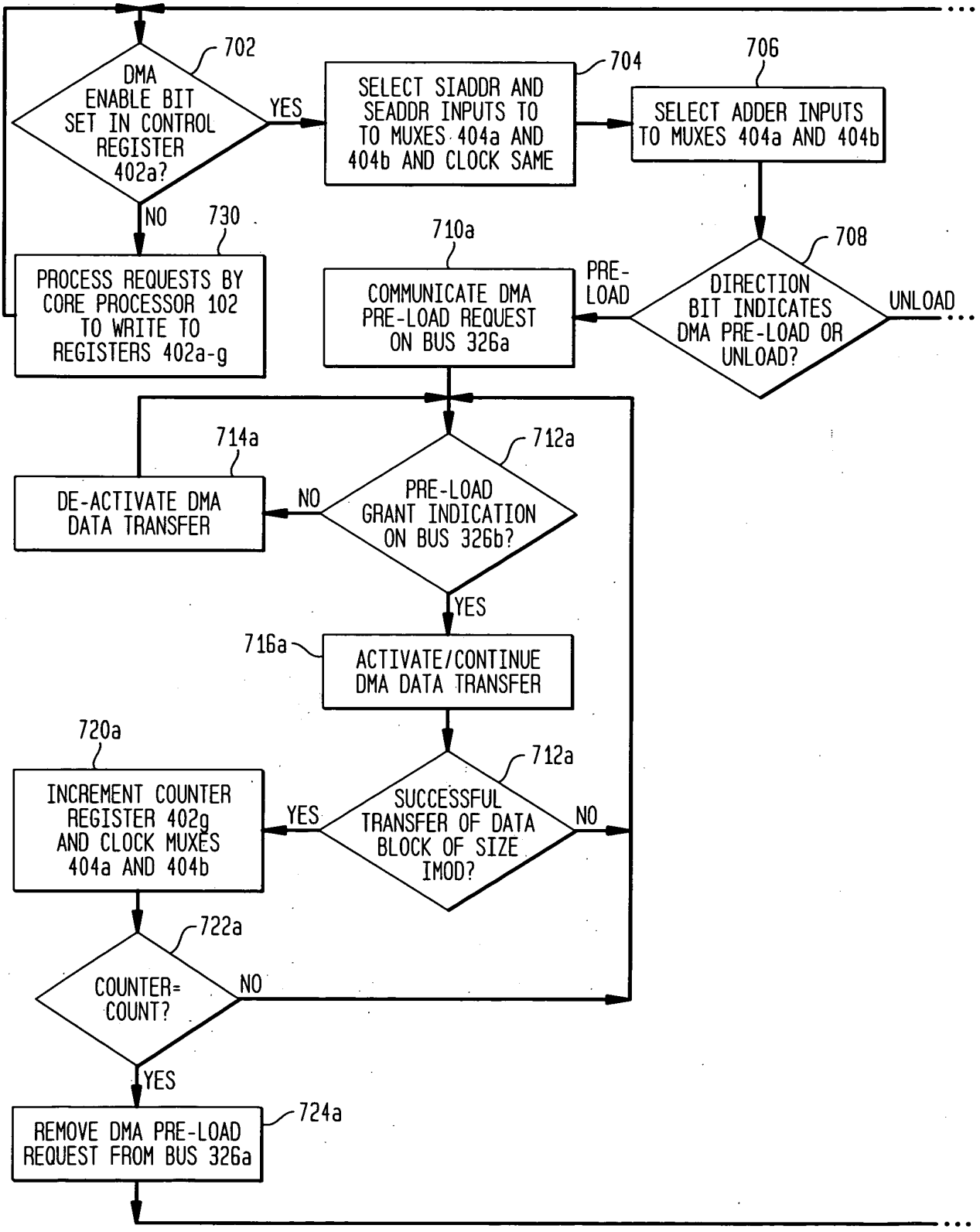
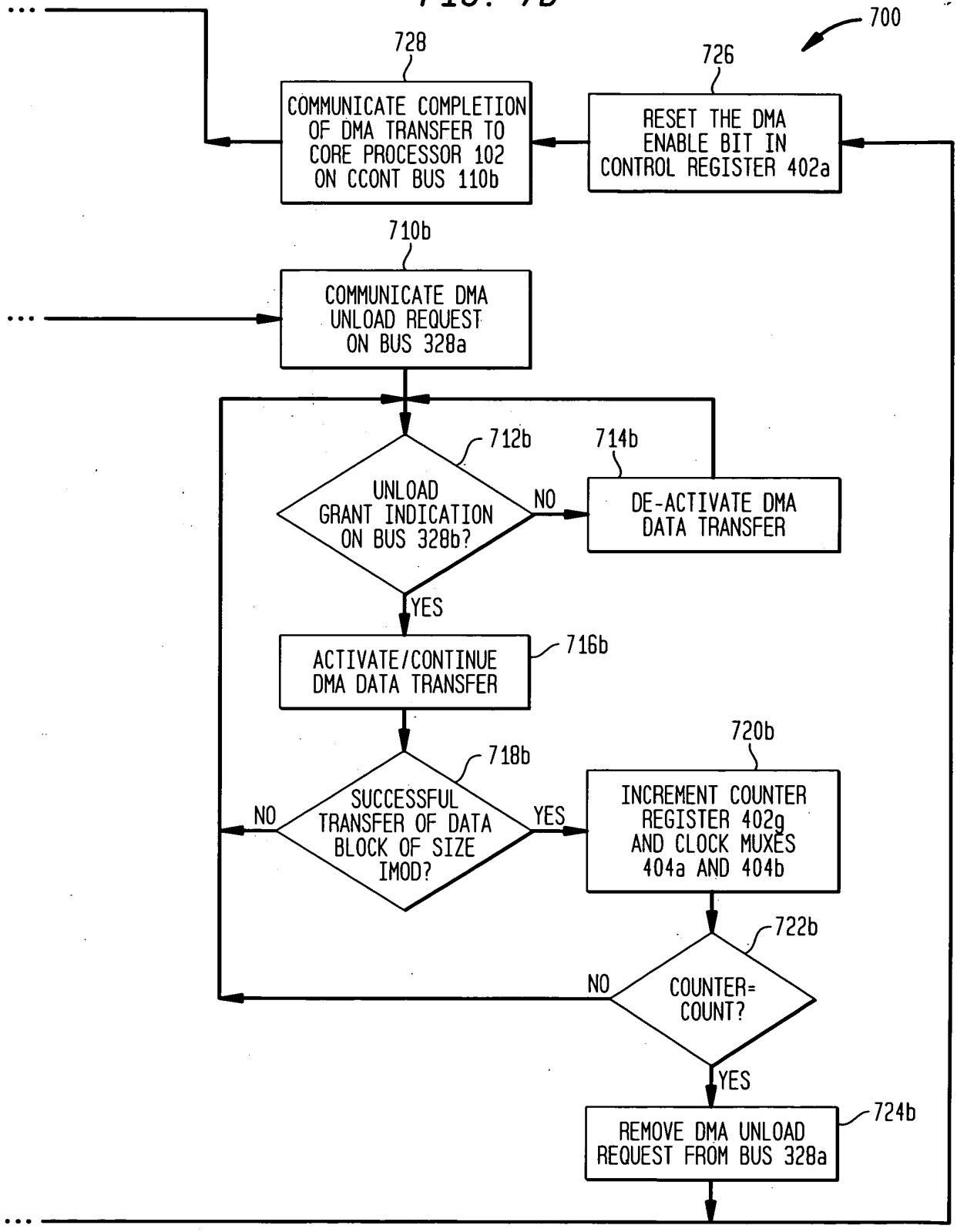
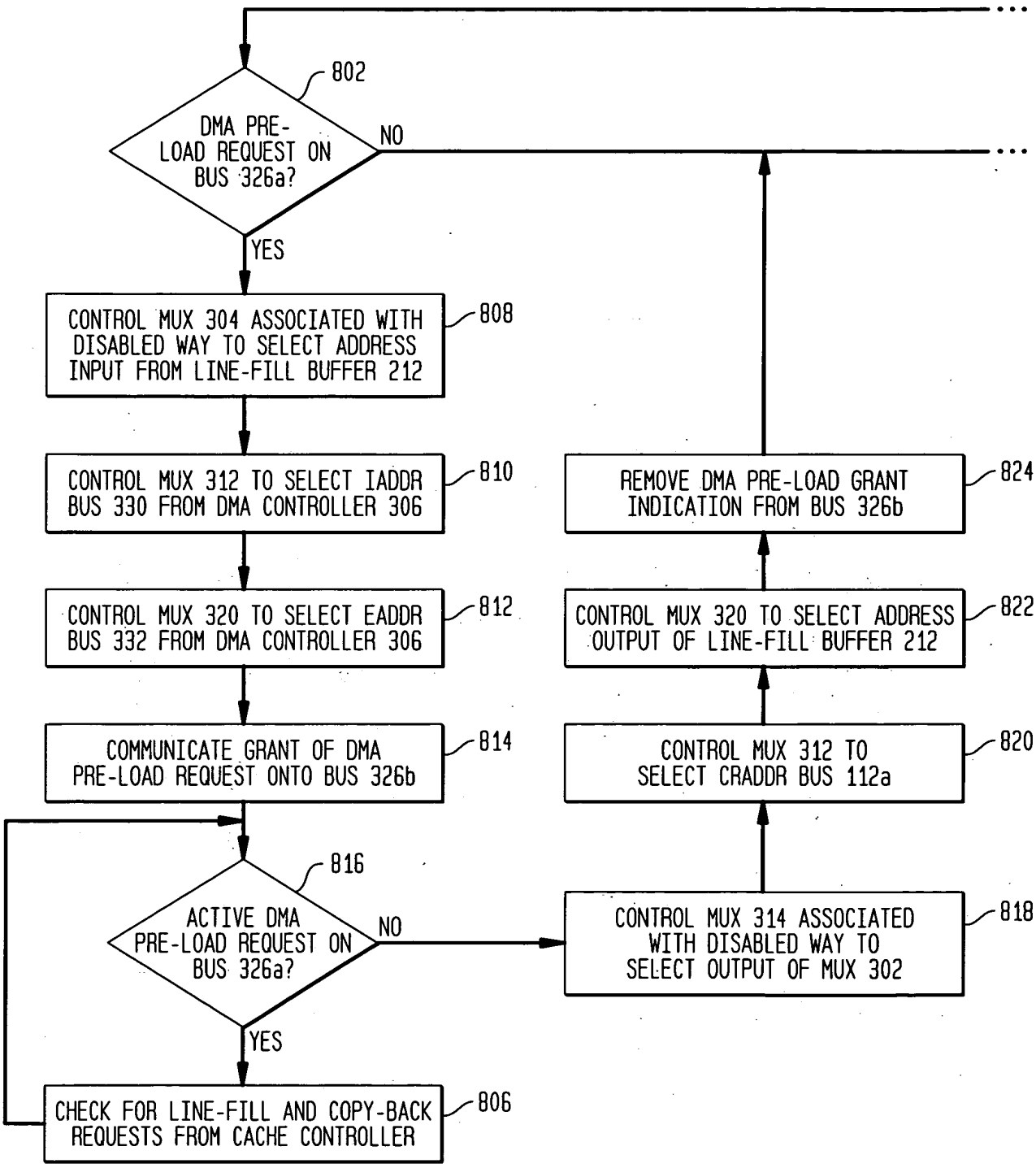

702
DMA ENABLE BIT SET IN CONTROL REGISTER 402a?
YES
NO
704
SELECT SIADDR AND SEADDR INPUTS TO TO MUXES 404a AND 404b AND CLOCK SAME
706
SELECT ADDER INPUTS TO MUXES 404a AND 404b
730
PROCESS REQUESTS BY CORE PROCESSOR 102 TO WRITE TO REGISTERS 402a-g
710a
COMMUNICATE DMA PRE-LOAD REQUEST ON BUS 326a
PRE-LOAD
708
DIRECTION BIT INDICATES DMA PRE-LOAD OR UNLOAD?
UNLOAD
714a
DE-ACTIVATE DMA DATA TRANSFER
NO
712a
PRE-LOAD GRANT INDICATION ON BUS 326b?
YES
716a
ACTIVATE/CONTINUE DMA DATA TRANSFER
720a
INCREMENT COUNTER REGISTER 402g AND CLOCK MUXES 404a AND 404b
YES
712a
SUCCESSFUL TRANSFER OF DATA BLOCK OF SIZE IMOD?
NO
722a
COUNTER= COUNT?
NO
YES
724a
REMOVE DMA PRE-LOAD REQUEST FROM BUS 326a

FIG. 7B



Docket No. 50T4804

FIG. 8A1



Patent Application Publication

FIG. 8A2

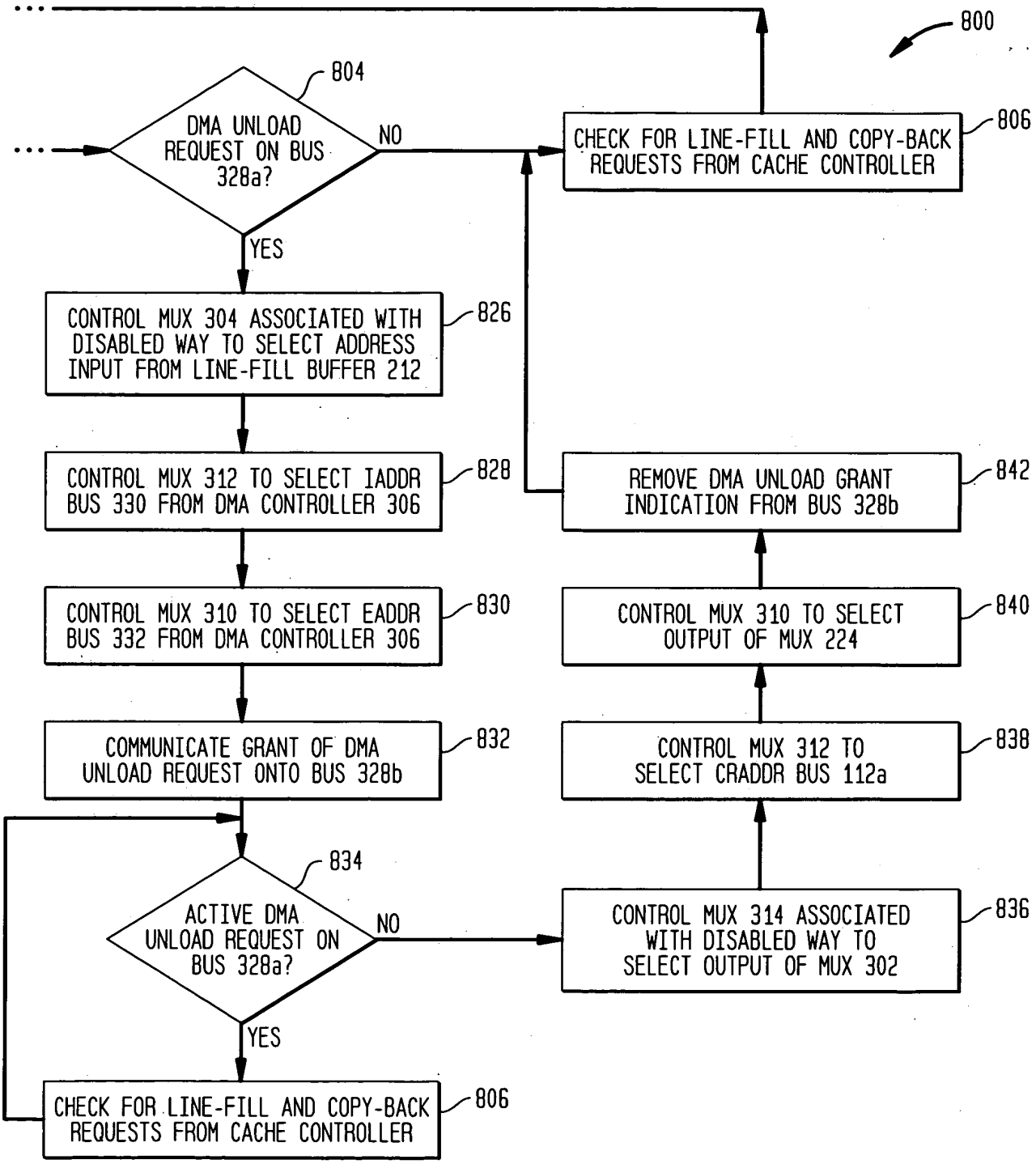

800
804
DMA UNLOAD REQUEST ON BUS 328a?
NO
YES
806
CHECK FOR LINE-FILL AND COPY-BACK REQUESTS FROM CACHE CONTROLLER
826
CONTROL MUX 304 ASSOCIATED WITH DISABLED WAY TO SELECT ADDRESS INPUT FROM LINE-FILL BUFFER 212
828
CONTROL MUX 312 TO SELECT IADDR BUS 330 FROM DMA CONTROLLER 306
830
CONTROL MUX 310 TO SELECT EADDR BUS 332 FROM DMA CONTROLLER 306
832
COMMUNICATE GRANT OF DMA UNLOAD REQUEST ONTO BUS 328b
834
ACTIVE DMA UNLOAD REQUEST ON BUS 328a?
NO
YES
806
CHECK FOR LINE-FILL AND COPY-BACK REQUESTS FROM CACHE CONTROLLER
836
CONTROL MUX 314 ASSOCIATED WITH DISABLED WAY TO SELECT OUTPUT OF MUX 302
838
CONTROL MUX 312 TO SELECT CRADDR BUS 112a
840
CONTROL MUX 310 TO SELECT OUTPUT OF MUX 224
842
REMOVE DMA UNLOAD GRANT INDICATION FROM BUS 328b

FIG. 8B1

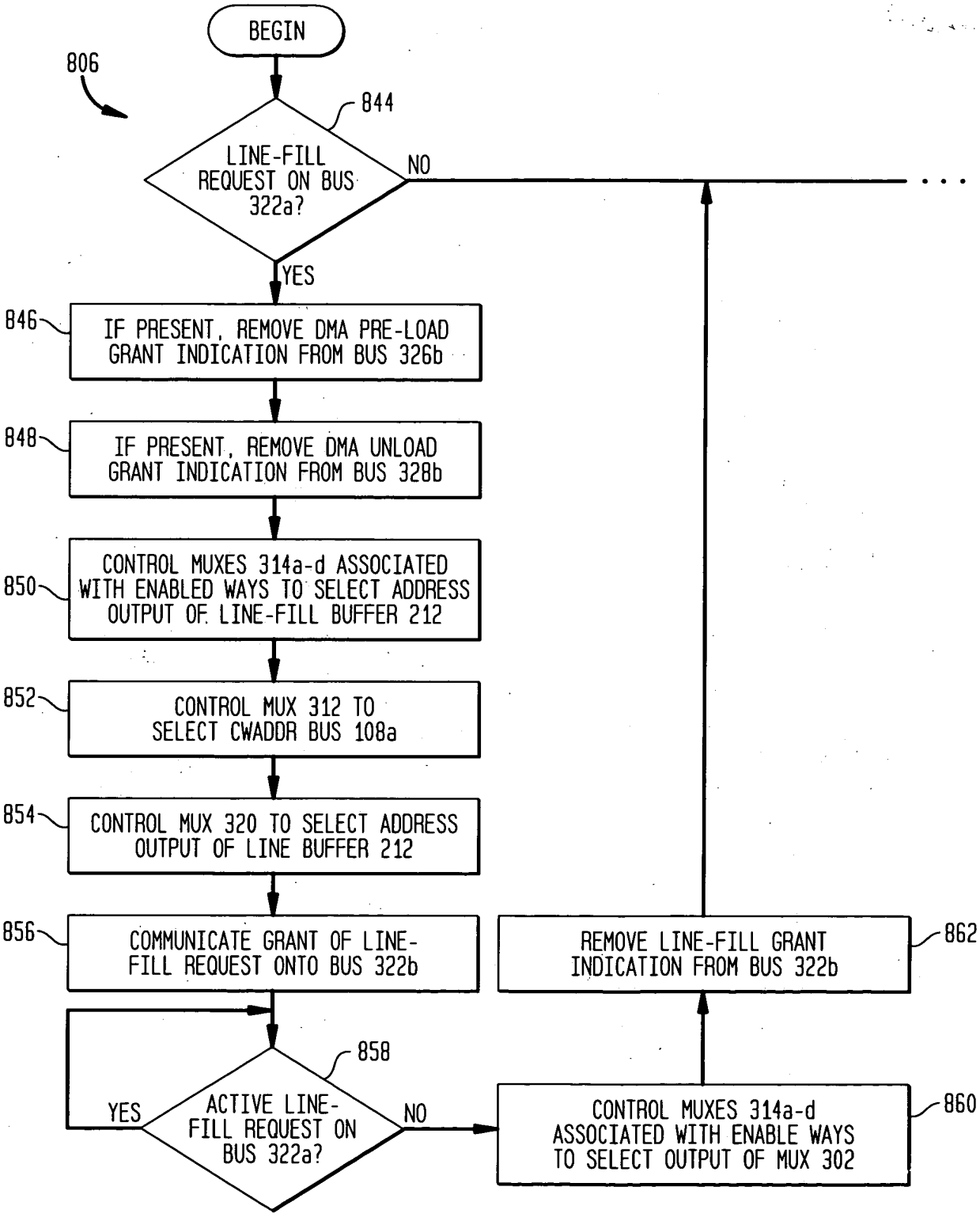
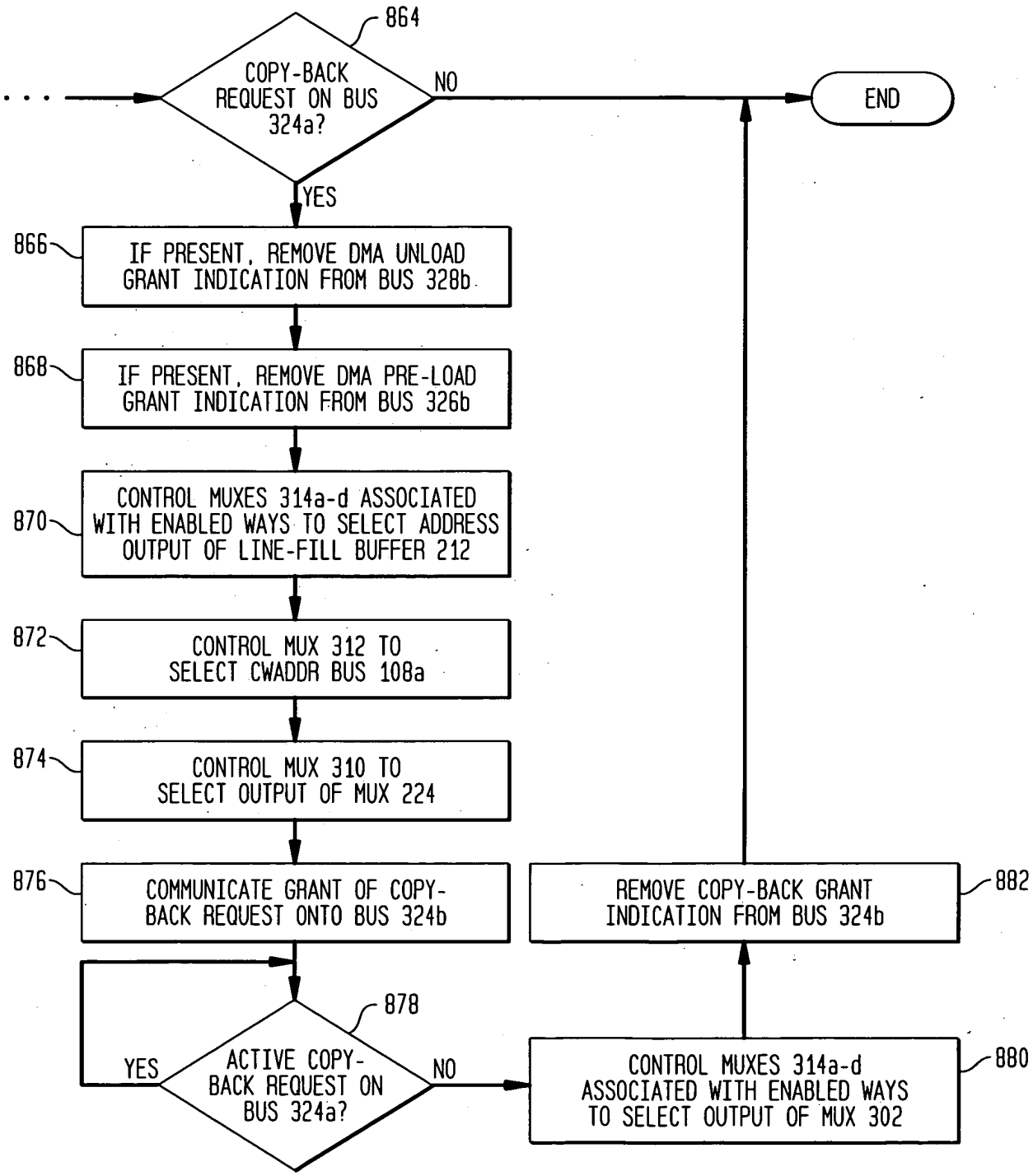

BEGIN
806
844
LINE-FILL REQUEST ON BUS 322a?
NO
YES
846
IF PRESENT, REMOVE DMA PRE-LOAD GRANT INDICATION FROM BUS 326b
848
IF PRESENT, REMOVE DMA UNLOAD GRANT INDICATION FROM BUS 328b
850
CONTROL MUXES 314a-d ASSOCIATED WITH ENABLED WAYS TO SELECT ADDRESS OUTPUT OF LINE-FILL BUFFER 212
852
CONTROL MUX 312 TO SELECT CWADDR BUS 108a
854
CONTROL MUX 320 TO SELECT ADDRESS OUTPUT OF LINE BUFFER 212
856
COMMUNICATE GRANT OF LINE-FILL REQUEST ONTO BUS 322b
858
YES
ACTIVE LINE-FILL REQUEST ON BUS 322a?
NO
860
CONTROL MUXES 314a-d ASSOCIATED WITH ENABLE WAYS TO SELECT OUTPUT OF MUX 302
862
REMOVE LINE-FILL GRANT INDICATION FROM BUS 322b

FIG. 8B2



08/760,954 08/29/96

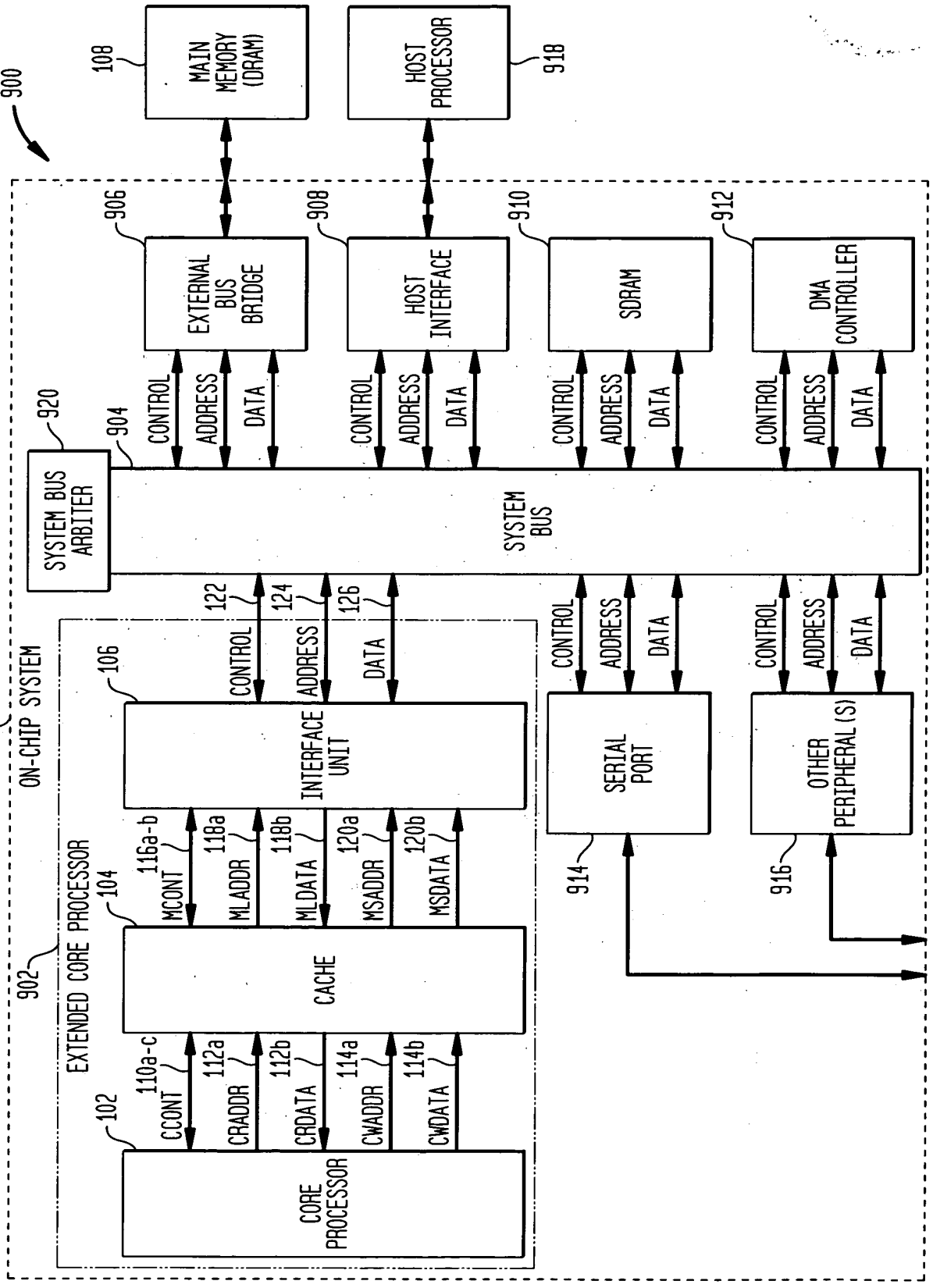

900
ON-CHIP SYSTEM
920
EXTENDED CORE PROCESSOR
902
CORE PROCESSOR
102
CACHE
104
INTERFACE UNIT
106
SYSTEM BUS ARBITER
920
SYSTEM BUS
904
MAIN MEMORY (DRAM)
108
HOST PROCESSOR
918
EXTERNAL BUS BRIDGE
906
HOST INTERFACE
908
SDRAM
910
DMA CONTROLLER
912
SERIAL PORT
914
OTHER PERIPHERAL (S)
916
CONTROL
ADDRESS
DATA
CCONT
110a-c
CRADDR
112a
CRDATA
112b
CWADDR
114a
CWDATA
114b
MCONT
116a-b
MLADDR
118a
MLDATA
118b
MSADDR
120a
MSDATA
120b
122
124
126

FIG. 9